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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,349	01/11/2002	Hideaki Yamamura	52433/674	6400

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EXAMINER
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MCHENRY, KEVIN L

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 02/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/031,349

Applicant(s)

YAMAMURA ET AL.

Examiner

Kevin L McHenry

Art Unit

1725

MCTNF

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13, 17-24, 31, 34, 38 and 39 is/are pending in the application.
- 4a) Of the above claim(s) 34, 38 and 39 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13, 17-19 and 21-24 is/are allowed.
- 6) ☒ Claim(s) 20 and 31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-13, 17-24, 31, 34, 38 and 39 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other:

*Election/Restrictions*

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-13, 17-24, and 31, drawn to cooling drums for casting metal strip.

Group II, claim(s) 34, 38, and 39, drawn to an apparatus and methods for processing a cooling drum.

2. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, their common special technical feature does not define a contribution over prior art: Claim 1 is either obvious over or anticipated by JP 06-328204 (see JP 06-328204; particularly abstract and Figures 1 and 3A-D). Accordingly, the special technical feature linking the three inventions, a cooling drum with fine holes, does not provide a contribution over the prior art. Therefore, there is no unity of invention and lack of unity is held by the examiner.

3. During a telephone conversation with John Kelly on 10 January 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-13, 17-24, and 31. Affirmation of this election must be made by applicant in replying to this Office action. Claims 34, 38, and 39 are withdrawn from further

consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### *Drawings*

5. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to because in Figure 25 item 10 should be instead be 28. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: items 24 (Figure 23) and 30 (Figure 34). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

*Specification*

8. The disclosure is objected to because of the following informalities:

On page 39, lines 10-11, the specification refers to the claims

On page 53, lines 1-2, the specification refers to the claims

On page 59, lines 10-11, the specification refers to the claims

On page 62, line 24, the specification refers to the claims

On page 63, lines 3-4, the specification refers to the claims

On page 72, lines 1-2, the specification refers to the claims

On page 78, line 9, Fig. 23 should be Fig. 24

On page 81, lines 1-2, the specification refers to the claims

On page 92, lines 11-12, the specification refers to the claims.

Appropriate correction is required.

*Claim Rejections - 35 USC § 103*

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 20 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 09-103849 in view of Tanaka et al. (U.S.P. 4,887,662).

JP 09-103849 teaches a cooling drum for continuously casting metal strip with

dimples having a depth of 30-150  $\mu\text{m}$  are formed adjacent to one another on the plated peripheral surface of the cooling drum. The thermal conductivity of the base material of the drum is 100 W/m·K and a nickel layer 10-500  $\mu\text{m}$  thick is formed over the drum. A film of cobalt 10-500  $\mu\text{m}$  thick is formed on the peripheral surface of the drum over the nickel layer (see JP 09-103849; particularly abstract and Figures).

JP 09-103849 does not teach that the dimples have a diameter of 0.5 to 3 mm in circle equivalent or that the dimples have any spacing or pitch.

Tanaka et al. teach a cooling drum for continuously casting metal strip with dimples that have a diameter of 0.1-1.2 mm and a spacing according to a relationship with the diameter of the dimples. This spacing can include values of 100-500  $\mu\text{m}$ . Tanaka et al. teach that dimples with this range of diameters and spacing are necessary to restrict the growth mode of the solidified shell on the drum to provide a thin strip free from small scale cracking (see U.S.P. 4,887,662; particularly Figure 9; column 2, lines 27-36; column 4, lines 1-8; column 7, lines 25-68).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the drum of JP 09-103849 by the teachings of Tanaka et al. One would have been motivated to do so in order to use dimples with a diameter and spacing that would restrict the growth mode of the solidified shell on the drum to provide a thin strip free from small scale cracking. The examiner notes that the dimples taught above read upon the fine holes cited in claim 31 and that claim 31 does not cite locations for the fine holes.

*Allowable Subject Matter*

11. Claims 1-13, 17-19, and 21-24 allowed.
12. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or suggest a cooling drum for continuously casting metal strip wherein dimples are formed on the peripheral surface of the drum adjacent to each other at the rims of the dimples with fine humps, fine holes, or fine unevenness of a prescribed shape formed at the rims of the dimples and/or on the indented surfaces of the dimples. Nor does the prior art of record teach or suggest a cooling drum for continuously casting metal strip wherein dimples are formed on the peripheral surface of the drum adjacent to each other at the rims of the dimples so that a region where the dimples are 20  $\mu\text{m}$  or less in average depth and exist consecutively at a distance of 1 mm or more accounts for 3% or less of the surface area of the cooling drum.


*Conclusion*

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Poirier et al. (U.S.P. 6,491,089), Ferretti et al. (U.S.P. 6,431,256), JP 05-261,487, Suichi et al. (U.S.P. 5,227,251), and Furuya et al. (U.S.P. 5,368,088) are cited of interest for illustrating the state of the art in continuous casting cooling drum design.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin L McHenry whose telephone number is (703) 305-9626. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



January 25, 2003



M. ALEXANDRA ELVE  
PRIMARY EXAMINER